

Attorney Docket No. 1237

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Serial No.: 09/540,578 Group Art Unit: 1638
Filed: March 31, 2000 Examiner: Ashwin D. Mehta
Type: INBRED MAIZE LINE PH3AV

Assistant Commissioner for Patents
Washington, D.C. 20231

RULE 132 DECLARATION
OF
DR. STEPHEN SMITH

Sir:

I, Stephen Smith, PhD., do hereby declare and say as follows:

1. I am skilled in the art of the field of the invention. I have a Ph.D. in Biochemical Systematics and Taxonomy of Maize and its Wild Relatives from Birmingham University. I have a M.Sc. in the Conservation and Utilization of Plant Genetic Resources from Birmingham University. I have a Bachelor of Science degree in Plant Sciences from London University. Since 1977 I have been engaged in the development, study and application of molecular markers to genetics, measuring genetic diversity and tracking pedigrees. I commenced this work at North Carolina State University as a post-doctoral research fellow. I have continued my engagement in these studies during my employment by Pioneer Hi-Bred from 1980 until the present. These studies have resulted in numerous scientific articles that have appeared in peer reviewed scientific literature.
2. This declaration is in response to the Examiner's rejection under, 35 U.S.C. § 102(e) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Kramer (U.S. Patent No. 6,124,534).
3. I have conducted an analysis of SSR marker data for inbred PH3AV and the inbred cited as prior art, PH1K2. Out of a total of 155 SSR loci examined, which allowed a sampling of each chromosome, there are 60 markers that show differences between PH3AV and PH1K2. This represents a difference for 39% for the markers tested. Of

Appendix F

09/540,578

these 60 markers, 26 were greater than 50 cM in distance, or unlinked on the genetic map.

4. Upon crossing PH3AV to any other maize line and selfing successive filial progenies, the odds of obtaining a PH3AV progeny that is the same as PH1K2 are 1 in 67,108,864. By the same logic, the odds of obtaining a PH3AV progeny that is the same as PH1K2 from an inbred maize line that retains genetic contribution from PH3AV. Assuming that (i) the cited prior art is used as the maize line to which PH3AV is crossed, (ii) that the only difference between PH3AV and PH1K2 are these 60 markers, and (iii) that all markers greater than 50 cM distance will segregate independently, the odds of obtaining a PH3AV progeny (provid that is the same as PH1K2) after one cycle of breeding is 1 in 67,108,864. Statistically it is extremely unlikely that a PH3AV progeny, after one cycle of breeding, would be the same as PH1K2.

5. Further, the assumptions made above vastly overstate the likelihood of breeding PH1K2 from PH3AV. For example, it is common practice in quantitative genetics to determine the relation of plants by differences in markers. In doing so, one extrapolates that a percentage difference in markers is indicative of a difference in the whole genome. To assume that the only differences between PH3AV and PH1K2 are for these 60 markers, when 60 markers constitute 39% of the 155 SSR loci examined, is a gross and unrealistic assumption. Further the current maize genetic map only has approximately sixty 50cM units, so by applying this limitation the maximum number of independently segregating loci one could obtain, using the most different maize lines that could ever be found, is sixty. These assumptions result in an over estimate of the odds of breeding PH1K2 from PH3AV.

6. Given the difference in molecular markers between PH3AV and PH1K2, it is my expert opinion that PH3AV and PH1K2 are very distinct inventions. It is also my expert opinion that, within the realm of what is statistically possible, any progeny of PH3AV developed through crossing PH3AV with another plant will be distinct from PH1K2. Given the facts and based on my education and scientific experience, I believe that the invention as claimed is not obvious nor anticipated by Kramer (U.S. Patent No. 6,124,534).

7. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

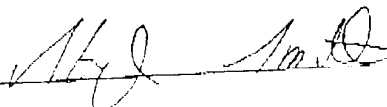
03/27/03 THU 14:55 FAX 515 334 6883

PIONEER HI-BRED DSM

0069

09/540,578

Date: March 14th 2003

By: 
Stephen Smith